Amendment to claims

WHAT IS CLAIMED IS:

1. A wireless Peak Reduction Equalizer circuit for use with multi-carrier signals in a wireless communication system to enhance the linearity and performance of the amplifier, in wireless cellular, PCS, wireless LAN, line of sight microwave, military, and satellite communication systems and any other none wireless applications, the Peak Reduction Equalizer circuit comprising:

   a multi-carrier receiver for the Peak Reduction Equalizer of IF or RF input signal to amplifier wherein the input signal is baseband then the multi-carrier receiver is bypassed;

   a digital signal processing block to reduce the peak of the multi-carrier input signal;

   a digital signal processing block that converts the peak reduced multi-carrier baseband to baseband representative of individual carrier signals;

   a digital signal processing block that equalizes the baseband representative of individual carrier to maintain the signal emission and quality requirements;

   a digital signal processing signal that up converts the equalized baseband representative of each carrier to its original baseband frequency;

   a multi-carrier transmitter block that prepare the Peak Reduced multi-carrier signal for delivery to multi-carrier amplifier.

2. The Peak Reduction Equalizer circuit according to claim 1, wherein multi-carrier input signal from the wireless transmitter is sampled using sub-harmonic sampling technique at the input frequency or at an intermediate frequency.

3. The Peak Reduction Equalizer circuit according to claim 1, wherein the multi-carrier input signal from the wireless transmitter is sampled using sub-

harmonic sampling technique at the input frequency or at an intermediate frequency and the digitized multi-carrier input signal is decimated to the appropriate number of samples per symbol for further digital signal processing.

4. The Peak Reduction Equalizer circuit according to claim 1, wherein the multi-carrier input signal from the wireless transmitter is baseband and is sampled using Nyquist sampling technique and interpolated to produce the baseband multi-carrier signal with appropriate number of samples per symbol.

5. The Peak Reduction Equalizer circuit according to claim 1, wherein the multi-carrier input signals from the wireless transmitter are in bit domain and the bit domain baseband signals are up converted, combined and interpolated to produce the digital multi-carrier baseband signal with appropriate number of sample per symbol.

6. The Peak Reduction Equalizer according to claim 1, wherein the digital multi-carrier signal is peak limited by a peak reduction equalizer function. The peak limited multi-carrier signal is then down converted to single channel baseband signals by digital down conversion. The individual baseband signals are low pass filtered and equalized and up converted back to their original baseband frequency before all individual baseband signals being combined again to produce the multi-carrier peak reduced baseband signal.

7. The Peak Reduction Equalizer according to claim 1, wherein the multi-carrier signal peak limiting can be perform in analog domain at an intermediate frequency (IF) , radio frequency, or analog baseband before being digitized.

8. The Peak Reduction Equalizer according to claim 1, wherein the peak limited digital multi-carrier baseband signal is converted to single channel baseband signals by digital down conversion.

9. The Peak Reduction Equalizer circuit according to claim 1, wherein the peak reduced signal is digitally up converted and converted to analog domain at an intermediate frequency or the output frequency.

10. The Peak Reduction Equalizer circuit according to claim 1, wherein the received signal strength of the input signal to Peak Reduction Equalizer circuit and transmit signal strength of the output from the Peak Reduction Equalizer circuit is dynamically measures to adjust the total gain of the Peak Reduction Equalizer circuit to zero

11. The Peak Reduction Equalizer circuit according to claim 1 and subsequent claims, when it is used in wireless cellular, wireless PCS, wireless LAN, microwave, wireless satellite, none wireless amplifiers, and any wireless communication systems used for military applications.

12. The Peak Reduction Equalizer circuit according to claim 1, wherein the DSP function can be implemented in programmable logic, FPGA, Gate Array, ASIC, and DSP processor